



PATENT APPLICATION

JFW/AF

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

On Appeal from Group: 3723

Junichi UENO

Application No.: 10/549,453

Examiner: R. ROSE

Filed: September 14, 2005

Docket No.: 125333

For: WAFER-HOLDING CARRIER, DOUBLE-SIDE POLISHING APPARATUS USING
THE SAME, AND DOUBLE-SIDE POLISHING METHOD OF WAFER

APPEAL BRIEF TRANSMITTAL

Commissioner for Patents
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Attached is the Brief on Appeal in the above-identified application.

Also attached is Check No. 209804, in the amount of \$510.00 (\$255.00 Small Entity), in payment of the fee due under 37 C.F.R. 41.20(b)(2).

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Respectfully submitted,

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Appeal Brief

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BRIEF ON APPEAL

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Appeal from Group 3723

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I. REAL PARTY IN INTEREST

The real party in interest for this appeal and the present application is Shin-Etsu Handotai Co., Ltd. by way of an Assignment recorded in the U.S. Patent and Trademark Office at Reel 017701, Frame 0036.

II. RELATED APPEALS AND INTERFERENCES

There are no prior or pending appeals, interferences or judicial proceedings known to the Appellants, Appellants' representative, or the Assignees that may be related to, or that will directly affect or be directly affected by or have a bearing upon, the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 11 and 19-31 are on appeal.

Claims 11 and 19-31 are pending.

No claims are allowed, and no claims are objected to only for being dependent from a rejected base claim, but are otherwise indicated to be allowable.

Claims 11 and 19-31 are rejected.

No claims are withdrawn from consideration.

Claims 1-10, 12-18, and 32-34 are canceled.

IV. STATUS OF AMENDMENTS

No Amendment After Final Rejection has been filed. An Information Disclosure Statement was filed on August 7, 2008. No amendments have been made after the June 11, 2008 Final Rejection was mailed.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present application relates to a wafer-holding carrier that is used when polishing both sides of a wafer such as a silicon wafer, and also further relates to a double-side polishing apparatus. *See* specification, page 1, lines 8-12.

Problems arise during wafer polishing if a polishing agent is not sufficiently supplied during the polishing process. In such a case rotation of the wafer in a holding hole is prevented and, thus, the wafer shape becomes tapered, or so-called peripheral sag is generated by accumulation of heat due to friction between the polishing pad and the carrier or the wafer. Thus, the wafer cannot be finished to have high flatness. *Id.* at paragraph bridging pages 4 and 5.

Claim 11 is directed to a wafer-holding carrier 1 (Fig. 1) that is used when holding wafers W (Fig. 4) between an upper turn table 16 (Fig. 4) and a lower turn table 17 (Fig. 4) to which polishing pads 18 and 19 (Fig. 4) are attached for polishing both sides of the wafers by a polishing agent (not depicted). *See* specification, page 7, lines 6-12. The carrier has polishing agent-passing holes 3, 4 (Fig. 1) for passing the polishing agent through as well as wafer-holding holes 2 (Fig. 1) for containing and holding the wafers. *See* specification, page 7, lines 12-15. The total area of the polishing agent-passing holes occupies more than 20% (*see* specification at pages 4 and 5; page 18, lines 19-25; and page 28, lines 7-19) and 30% or less of a main surface of the carrier (*see* specification at page 8, lines 11-17) and each of the polishing agent-passing holes has a circular shape of a diameter of 5 mm-30 mm (*see* specification at page 8, lines 18-20 and page 16, line 24-page 17, line 12).

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection are presented for review:

1) Claims 11 and 19–31 are rejected under 35 U.S.C. §112, first paragraph, for failing to comply with the written description requirement;

2) Claims 11, 19, 23, 27, and 31 are rejected under 35 U.S.C. §102(b) as being anticipated by JP 10-180623 to Susumu et al. ("Susumu");

3) Claims 11, 19, 21, 23, 25, 27, 29 and 31 are rejected under 35 U.S.C. §103(a) as obvious over Susumu; and

4) Claims 20, 22, 24, 26, 28 and 30 are rejected under 35 U.S.C. §103(a) as obvious over Susumu in view of JP 10-202511 to Fuminari et al. ("Fuminari").

VII. ARGUMENT

Claims 11 and 19-31 are rejected under 35 U.S.C. §112, first paragraph, for failing to comply with the written description requirement.

Claims 11, 19, 23, 27, and 31 are rejected under 35 U.S.C. §102(b) as being anticipated by JP 10-180623 to Susumu et al. ("Susumu").

Claims 11, 19, 21, 23, 25, 27, 29 and 31 are rejected under 35 U.S.C. §103(a) as obvious over Susumu.

Claims 20, 22, 24, 26, 28 and 30 are rejected under 35 U.S.C. §103(a) as obvious over Susumu in view of JP 10-202511 to Fuminari et al. ("Fuminari").

A. **The rejection of claims 11 and 19-31 for failing to comply with the written description requirement of 35 U.S.C. §112, first paragraph is improper**

Claim 11, as originally presented in the September 2005 Preliminary Amendment, recited, "the total area of the polishing agent-passing holes occupies 15% or more of a main surface of the carrier" (emphasis added). In the first Office Action on the merits, the Examiner rejected claim 11 under 35 U.S.C. 102(b) as anticipated by Susumu. *See* August 2006 Office Action. In response, Appellants amended claim 11 to recite "the total area of the polishing agent-passing holes occupies more than 20% of a main surface of the carrier" (emphasis added). *See* November 2006 Amendment. Appellants' response to the rejections was deemed to place the application in condition for allowance, and a Notice of Allowance was mailed on February 7, 2007.

The Notice of Allowance was subsequently vacated and the claims were rejected under five new grounds, including a rejection of claim 11 under 35 U.S.C. §112, second paragraph, because the recitation of "more than 20%" was allegedly indefinite in view of the specification's disclosure of an upper limit of 30%. Additionally, the recitation of "more than 20%" was deemed to constitute new matter and, thus, claim 11 was rejected for allegedly not

meeting the written description requirement set forth in 35 U.S.C. §112, first paragraph. *See* May 2007 Office Action.

In response, Appellants amended claim 11 to recite: "the total area of the polishing agent-passing holes occupies more than 20% and 30% or less of a main surface of the carrier" (emphasis added), and traversed the written description rejection. *See* August 2007 Amendment. Although the indefiniteness rejection was overcome, the Examiner apparently was not persuaded by the Appellants' arguments with respect to the new matter/written description rejection. *See* October 2007 Final Rejection. However, the Examiner failed to respond to the Appellants' rebuttal arguments, despite the requirement set forth in MPEP §2163.04 that if an Examiner maintains a written description rejection, the Examiner needs to fully respond to the rebuttal arguments.

In response to the Final Rejection, Appellants filed a Request for Reconsideration, wherein Appellants respectfully pointed out the Examiner's duty to respond to their rebuttal arguments and, for the convenience of the Examiner, repeated the rebuttal arguments previously made of record. Appellants also included additional arguments as to why the rejection was improper. *See* January 2008 Request for Reconsideration After Final Rejection. In response, the Examiner issued an Advisory Action where it simply indicated "The rejections under 35 USC 112, 1st paragraph, and art rejections are still deemed valid, for reasons set forth in the last Office action." *See* February 2008 Advisory Action.

In response, Appellants filed an Amendment with a Request for Continued Examination (RCE), wherein claim 11 was substantively amended to include the subject matter of claim 13. In the Remarks, Appellants again respectfully pointed out the Examiner's duty to respond to their rebuttal arguments and, for the convenience of the Examiner, repeated the rebuttal arguments previously made of record.

In response, the Examiner issued a first action Final Rejection, wherein he at least partially replied to the rebuttal arguments. With respect to the written description rejection, the Examiner acknowledged that the Appellants "provided evidence of data points within the newly recited in narrower range of whole size ratio" but asserted that this was insufficient to overcome the rejection because:

1. The narrower lower limit of hole size ratio of 'greater than 20%' as a starting limit was not conceived by Applicant.
2. The narrower lower limits of hole size ratio of 'greater than 20%' was only introduced as a critical starting point after reviewing the art applied against the broader range.
3. There is absolutely no criticality assigned to this lower limit as a starting point.
4. Applicant's specification clearly allows for lower values.

See June 11, 2008, Office Action, page 4, item 9.

1. **The Examiner has failed to present by a preponderance of evidence why a person skilled in the art would not recognize from the specification that the range recited in claim 11 is part of the Appellants' invention**

The Examiner must have a reasonable basis to challenge the adequacy of the written description. Specifically, the Examiner has the initial burden of presenting by a preponderance of evidence why a person skilled in the art would not recognize in the specification a description of the invention defined by the claims. *In re Wertheim*, 541 F.2d 257, 262, 191 USPQ 90, 96 (CCPA 1976). The Examiner clearly has not met his burden.

In the initial rejection, the Examiner stated, "The new claimed limitation of 'more than 20%' as a lower limits of acceptable hole size, is deemed to constitute new matter. Applicant's specification clearly allows for hole sizes smaller than this recited lower starting limit." See May 2007 Office Action, paragraph bridging pages 2 and 3. However, the fact

that Appellants claim less than what is disclosed in the specification does not, by itself, establish that a person skilled in the art would not recognize in the specification a description of the invention defined by the claims. Similarly, the Examiner's assertion that Appellants narrowed the claimed range only after reviewing the art applied against the broader range does not support the rejection. The *In re Wertheim* decision addressed both of these points:

Mere comparison of ranges is not enough, nor are mechanical rules a substitute for an analysis of each case on its facts to determine whether an application conveys to those skilled in the art the information that the applicant invented the subject matter of the claims. In other words, we must decide whether the invention appellants seek to protect by their claims is part of the invention that appellants have described as theirs in the specification. That what appellants claim as patentable to them is less than what they describe as their invention is not conclusive if their specification also reasonably describes that which they do claim. Inventions are constantly made which turn out not to be patentable, and applicants frequently discover during the course of prosecution that only a part of what they invented and originally claimed is patentable.

Id. at 97 (emphasis added). See also the opinion of Judge Learned Hand in *Engineering Development Laboratories v. Radio Corp. of America*, 153 F.2d 523, 526-27, 68 USPQ 238, 242 (2d Cir. 1946), quoted with approval in *In re Driscoll*, 562 F.2d 1245, 1250, 195 USPQ 434, 438 (CCPA 1977):

If, when [applicants] yield any part of what they originally believed to be their due, they substitute a new "invention," only two courses will open to them: they must at the outset either prophetically divine what the art contains, or they must lay down a barrage of claims, starting with the widest and proceeding by the successive incorporation of more and more detail, until all combinations have been exhausted which can by any possibility succeed. The first is an impossible task; the second is a custom already honored in the breach than in the observance, and its extension would only increase that surfeit of verbiage which has for long been the curse of patent practice, and has done much to discredit it. It is impossible to imagine any public purpose which it could serve.

The Examiner also argues, "There is absolutely no criticality assigned to this lower limit as a starting point." Criticality is completely irrelevant to an analysis of the sufficiency of written description support for a claim limitation. As in *In re Johnson and Farnham*, 558 F.2d 1008, 1019, 194 USPQ 187, 196 (CCPA 1977), Appellants are merely excising [what the Examiner asserts is] the invention of another, to which they are not entitled, and are not creating an "artificial subgenus" or claiming "new matter." Thus, the question is not one of criticality but whether the broader disclosed range describes the narrower claimed range. This issue was also addressed by the *In re Wertheim* court:

Claims 2, 37, and 38, which claim a solids content range of "between 35% and 60%," present a different question. They clearly claim a range within the described broad range of 25% to 60% solids; the question is whether, on the facts, the PTO has presented sufficient reason to doubt that the broader described range also describes the somewhat narrower claimed range. We note that there is no evidence, and the PTO does not contend otherwise, that there is in fact any distinction, in terms of the operability of appellants' process or of the achieving of any desired result, between the claimed lower limit of solids content and that disclosed in the Swiss application. We see an important practical distinction between broad generic chemical compound inventions, for example, as in *In re Ruschig*, supra, in which each compound within the genus is a separate embodiment of the invention, and inventions like that at bar, in which the range of solids content is but one of several process parameters. What those skilled in the art would expect from using 34% solids content in the concentrated extract prior to foaming instead of 35% is a different matter from what those skilled in the art would expect from the next adjacent homolog of a compound whose properties are disclosed in the specification. We wish to make it clear that we are not creating a rule applicable to all description requirement cases involving ranges. Where it is clear, for instance, that the broad described range pertains to a different invention than the narrower (and subsumed) claimed range, then the broader range does not describe the narrower range.

Id. at 98 (citations omitted).

Similar to *Wertheim*, the Examiner in this case has failed to present evidence that the broader described range pertains to a different invention than the narrower (and subsumed)

claimed range or any other evidence or reasoning showing why one of skill in the art would doubt that Appellants invented or were in possession of the narrower claimed range from the disclosure of the broader range and the specific embodiments therein found in the original disclosure. Instead, the Examiner has done nothing more than argue lack of literal support, which is not sufficient to support the written description rejection. See *In re Wertheim* at page 98:

The PTO has done nothing more than to argue lack of literal support, which is not enough. If lack of literal support alone were enough to support a rejection under §112, then the statement of *In re Lukach*, supra, 58 CCPA at 1235, 442 F.2d at 969, 169 USPQ at 796, that "the invention claimed does not have to be described in *ipsis verbis* in order to satisfy the description requirement of §112," is empty verbiage. The burden of showing that the claimed invention is not described in the specification rests on the PTO in the first instance, and it is up to the PTO to give reasons why a description not in *ipsis verbis* is insufficient.

Because the Examiner has failed to provide any evidence or reasoning why one of skill in the art would not recognize from the original disclosure that Appellants were in possession of, as of the filing date of the application, the specific subject matter of claim 11, the Examiner has failed to meet his initial burden to carry the rejection. As such, Appellants respectfully submit that the rejection is improper and should be withdrawn.

2. Contrary to the Examiner's assertions, the specification as originally filed clearly conveys to those skilled in the art that the inventors were in possession of the recited range of "more than 20% and 30% or less"

To provide written description for a claim, the specification as originally filed must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, the inventors were in possession of the invention as claimed. *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991); MPEP §2163(1). This possession may be shown by any number of ways and the applicant need not describe every

claim feature exactly because there is no *in haec verba* requirement. *See* MPEP §2163(I)(b). Rather, to satisfy the written description requirement, all that is needed is "reasonable clarity." *See* MPEP §2163.02. Also, an adequate description may be made in any way through express, implicit, or even inherent disclosures in the application, including words, structures, figures, diagrams, and/or formulae. *See* MPEP §§2163(I), 2163.02.

The specification clearly provides an implicit disclosure of wafer-holding carriers where "the total area of the polishing agent-passing holes occupies more than 20% and 30% or less of a main surface of the carrier." The lower limit of "more than 20%" is within the range of "15% or more" and "30% or less" disclosed in the specification. *See* specification, pages 7 and 8.

The specification also expressly discloses two wafer carriers that have an occupied area ratio of polishing agent-passing holes that fall within the recited range. Example 2 discloses a wafer carrier in accordance with claim 11, wherein the total area of the polishing agent-passing holes occupies 28.6% of a main surface of the carrier. *See* specification, page 28. The specification also discloses another wafer carrier that meets the requirements of claim 11:

[I]f a carrier has a diameter of about 1190 mm as described above, the occupied area of polishing agent-passing holes can be controlled to be 30% or less even when the carrier is provided with one hole having a diameter of 200 mm in the center of the carrier and 520 holes having a diameter of about 27 mm.

See specification, page 18, lines 19–25. The occupied area of polishing agent-passing holes of this embodiment is 29.6%.

Thus, although the specification does not expressly disclose a range of "more than 20% and 30% or less," the specification expressly describes two embodiments that fall within the claimed range. MPEP §2163.05(III), which is directed to written description support for claim amendments that change numerical range limitations, discusses *In re Wertheim* where a

claim was amended to have a narrower lower range limitation that was not expressly disclosed in the specification (emphasis added):

With respect to changing numerical range limitations, the analysis must take into account which ranges one skilled in the art would consider inherently supported by the discussion in the original disclosure. In the decision in *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976), the ranges described in the original specification included a range of “25%- 60%” and specific examples of “36%” and “50%.” A corresponding new claim limitation to “at least 35%” did not meet the description requirement because the phrase “at least” had no upper limit and caused the claim to read literally on embodiments outside the “25% to 60%” range, however a limitation to “between 35% and 60%” did meet the description requirement.

Despite the fact that Appellants have specifically described and cited to this holding of *In re Wertheim* in three previous responses, the Examiner has failed to distinguish the facts in this case from the *In re Wertheim* decision or present other case law that justifies his finding that two expressly disclosed embodiments falling within the recited range do not adequately support the recited range.

Also, it is clear from the original disclosure that the inventors were inherently in possession of the entire range of the expressly disclosed occupied area of polishing agent-passing holes of “15% or more” and “30% or less” and any subrange. The table below shows four specific embodiments discussed in the specification:

	Carrier Diameter	Through-Holes Diameter	Number of Through-Holes	Center Hole Diameter	Total Area of Polishing Agent-Passing Holes
A ¹	1190 mm	18 mm	540	200 mm	15.2%
B ²	1190 mm	20 mm	510	200 mm	17.2%
C ³	1190 mm	26 mm	540	200 mm	28.6%
D ⁴	1190 mm	27 mm	520	200 mm	29.6%

¹ See specification, paragraph bridging pages 17 and 18.

² See specification, page 26, lines 7–17 (Example 1).

³ See specification, page 28, lines 7–19 (Example 2).

⁴ See specification, page 18, lines 19–25.

As can be seen, each of the four carriers has the same carrier diameter and center hole diameter. However, the four embodiments differ in through-hole diameters and the number of through-holes. A and C, however, each have 540 through-holes, and only differ in the size of the through holes (A=18 mm, C=26 mm):

	Carrier Diameter	Through-Holes Diameter	Number of Through-Holes	Center Hole Diameter	Total Area of Polishing Agent-Passing Holes
A	1190 mm	18 mm	540	200 mm	15.2%
C	1190 mm	26 mm	540	200 mm	28.6%

From just A and C above, one of ordinary skill in the art would recognize that Appellants were in possession of wafer carriers having a diameter of 1190 mm, with a center hole diameter of 200 mm, and having 540 through-holes that ranged in the size of 18 mm to 26 mm. As such, one of skill in the art would clearly recognize that Appellants were in possession of wafer carriers having a total area of polishing agent-passing holes ranging from 15.2% to 28.6% from just these two embodiments. Combined with the rest of the original disclosure, one of ordinary skill in the art would recognize that the Appellants were in possession of, as of the filing date of the application, the entire range of 15% to 30% and any sub-range, including "more than 20% and 30% or less."

For at least these reasons, Appellants respectfully submit that the amendments to claim 11 to narrow the recited range of the total area of polishing agent-passing holes to "more than 20% and 30% or less" did not introduce new matter into the claim, as the narrower range is sufficiently supported by the specification. Accordingly, Appellants request that the rejection of claims 11 and 19-31 under 35 U.S.C. §112, first paragraph, for failing to comply with the written description requirement be reversed.

B. Claims 11, 19, 23, 27, and 31 are not anticipated by Sumusu

Claims 11, 19, 23, 27, and 31 are rejected under 35 U.S.C. §102(b) as being anticipated JP 10-180623 to Susumu et al. ("Susumu"). Appellants note that the Examiner has not provided an English-language translation of any parts of the reference other than the abstract.

1. Product claims 11, 19, 23, and 31

It is well settled that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *See* MPEP §2131. The Examiner has failed to establish that Susumu teaches each and every limitation recited in the rejected claims.

Independent claim 11 recites (emphasis added):

A wafer-holding carrier which is used when holding wafers between an upper turn table and a lower turn table to which polishing pads are attached, and polishing both sides of the wafers by a polishing agent, wherein the carrier has polishing agent-passing holes for passing the polishing agent through as well as wafer-holding holes for containing and holding the wafers, and the total area of the polishing agent-passing holes occupies more than 20% and 30% or less of a main surface of the carrier, and each of the polishing agent-passing holes has a circular shape and a diameter of 5 mm - 30 mm.

Susumu does not disclose such a combination of features.

In contrast to the present application, Susumu is directed to a wafer-holding carrier used in a lapping process (see abstract), not a polishing process as required in the present claims. The two processes are not the same, and are not done for the same purposes. For example, colloidal silica, which is a very fine abrasive material, may be used for polishing silicon wafers. *See* specification, page 24, lines 2–7. On the other hand, lapping utilizes a much coarser abrasive, such as the artificial emery.

Furthermore, Susumu fails to disclose a "total area of the polishing agent-passing holes occupies more than 20% and 30% or less of a main surface of the carrier." In Susumu,

an area of through holes is set between 0.8% and 20% of the hole surface area of the carrier and that each of the opening area of the through holes is preferably not larger than 60 cm² (87.4 mm in diameter). *See* Sumusu at Abstract. The Examiner argues "it is clear from figure 4 that hole size ratios greater than 20% were produced, although arbitrarily, the cutoff of acceptability was determined to be 20%, based upon tendency for crack formation. It is clear that wafer carriers having hole size ratios of greater than 20% were conceived and/or produced." *See* June 2008 Office Action, paragraph bridging pages 2 and 3. Appellants respectfully disagree.

When a prior art reference discloses a range which touches or overlaps the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation. In order to anticipate the claims, the claimed subject matter must be disclosed in the reference with sufficient specificity to constitute an anticipation under the statute. What constitutes a "sufficient specificity" is fact dependent. *See* MPEP § 2131.03(II).

The Examiner presents no evidence of any specific examples disclosed by Susumu that fall within the range recited by claim 11. Figure 4 of Susumu simply shows data points on a graph. However, the Examiner presents no evidence to establish that any of the data points representing greater than 20% were obtained from actual examples as opposed to prophetic examples. Furthermore, the data points may have been extrapolated. Without further evidence, the Examiner cannot establish that Susumu provides any specific examples falling within the claimed range.

Additionally, claim 11 was amended in the March 2008 Amendment to recite, "each of the polishing agent-passing holes has a circular shape and a diameter of 5 mm - 30 mm" This was the subject matter of claim 13, which was not rejected as anticipated by Susumu. Notwithstanding the fact that the subject matter of claim 11 as a whole had not previously

been rejected as anticipated by Susumu, the Examiner issued a first action Final Rejection. *See* June 2008 Office Action. Moreover, the Examiner failed to assert in the Final Rejection that Susumu discloses this limitation added to claim 11.

Susumu only discloses in the abstract that "the opening area of each through hole 19 is preferably not larger than 60 cm²" (87.4 mm in diameter if the holes are circular). This does not disclose a range of diameters of 5 mm - 30 mm with "sufficient specificity" to anticipate claim 11.

For at least the reasons discussed above, Susumu does not anticipate claim 11. Claims 19, 23, and 31 variously depend from claim 11 and, thus, also are not anticipated by Susumu. Accordingly, reversal of the rejection is respectfully requested.

2. Method claim 27

Claim 27 recites:

A method for polishing both sides of wafers comprising using the double-side polishing apparatus according to Claim 19, containing wafers in the wafer-holding holes of the carrier arranged between the upper turn table and the lower turn table, moving the upper turn table and the lower turn table relatively while supplying a polishing agent from the upper turn table side, and moving the carrier between the upper turn table and the lower turn table, thereby to polish the both sides of the wafers.

Because claim 27 requires all of the limitation of claim 19, which in turn requires all of the limitation of independent claim 11, claim 27 is not anticipated by Susumu for at least the reasons discussed above. Moreover, the title of Susumu's application is "Lapping Device" and the abstract, while referring to "lapping" twice, fails to disclose a polishing process. The Examiner has failed to present any evidence that Susumu discloses a method for polishing wafers as recited in claim 27.

Accordingly, for this additional reason, Appellants respectfully submit that method claim 27 is not anticipated by Susumu. Thus, reversal of the rejection is respectfully requested.

C. Claims 11, 19, 21, 23, 25, 27, 29 and 31 would not have been rendered obvious by Susumu

The Examiner rejects claims 11, 19, 21, 23, 25, 27, 29 and 31 under 35 U.S.C. §103(a) as having been obvious over Susumu.

1. Product claims 11, 19, 23, 25, and 31

In contrast to the wafer-holding carrier of claim 11, Susumu is directed to a wafer-holding carrier used in a lapping process, not a wafer holder used in a polishing process as recited in claim 11. Even if the processes were the same, the ranges of the hole areas in Susumu and claim 11 are different. In Susumu, an area of through holes is set between 0.8% and 20% of the hole surface area of the carrier, whereas claim 11 recites that the "total area of the polishing agent-passing passing holes occupies more than 20% and 30% or less of a main surface of the carrier."

Furthermore, Susumu teaches away from the wafer-holding carrier of claim 11. Susumu teaches that hole area ratios over 20% lower the mechanical strength of the carrier and result in imperfect hold of the wafers, causing the wafers to crack. *See abstract.* However, the Examiner asserts that it would have been obvious for one of skill in the art to modify the wafer carriers disclosed by Susumu to have a hole size ratio greater than 20%. The Examiner argues that such a modification "is regarded as being an obvious matter of design choice...depending upon the durability desirable in the final product." *See June 2008 Office Action, page 3, item 7.* This argument is nonsensical in view of Susumu's indication that the problem to be solved by its invention was preventing a wafer from being scratched on its underside and cracked during a lapping process. *See, e.g., Susumu at abstract.* Thus, if the wafer carriers disclosed by Susumu are modified as proposed by the Examiner, this would

result in wafers that are cracked during a lapping process, which would be contrary to the intended purpose of Susumu's invention. It is well settled that if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Furthermore, Appellants' specification provides results from experiments carried out with four different wafer carriers used for double-side polishing of silicon wafers that are unexpected from the teachings of Susumu. *See* pages 26–28. Comparative examples 1 and 2 employed "conventionally used" carriers wherein the area occupied by the through-holes of the carriers were 10.77% and 14.30%, respectively. On the other hand, examples 1 and 2 employed wafer carriers in accordance with the disclosure having an area occupied by the through-holes of 17.23% and 28.60%, respectively. The flatness of the polished wafers was measured using a flatness tester. The flatness of comparative examples 1 and 2 were measured to be 0.32 μm SFQRmax and 0.25 μm SFQRmax, whereas the flatness of examples 1 and 2 were measured to be 0.12 μm SFQRmax and 0.11 μm SFQRmax. Of note is the fact that the wafer carrier of example 2 (28.60% hole ratio) achieved better flatness than the wafer carrier of example 1 (17.23% hole ratio). Thus, the fact that improved results could be obtained from wafer carrier having a hole ratio greater than 20% would have been completely unexpected from Susumu.

Therefore, claim 11 would not have been rendered obvious by Susumu. Claims 19, 21, 23, 25, and 31 variously depend from claim 11 and, thus, also would not have been rendered obvious by Susumu. Accordingly, reversal of the rejection is respectfully requested.

2. Method claims 27 and 29

Method claim 27 is set forth as discussed above, and method claim 29 depends from claim 27. As such, claims 27 and 29 require all the limitations of independent claim 11.

Thus, claims 27 and 29 would not have been rendered obvious by Susumu for at least the reasons discussed above. Additionally, as previously discussed, Susumu is directed to a lapping device and fails to disclose a method of polishing. The Examiner fails to 1) state the differences between claims 27 and 29 and Susumu, and 2) provide a reason or rationale why one of skill in the art would have used the lapping device disclosed by Susumu in a polishing process.

For the reasons discussed above, method claims 27 and 29 would not have been rendered obvious by Susumu. Accordingly, reversal of the rejection is respectfully requested.

**D. Claims 20, 22, 24, 26, 28 and 30 would not have been
rendered obvious by Susumu in view of Fuminari**

The Examiner rejects claims 20, 22, 24, 26, 28 and 30 under 35 U.S.C. §103(a) as obvious over Susumu in view of Fuminari.

1. Product claims 20, 22, 24, and 26

Claims 20, 22, 24, 26, 28 and 30 variously depend from, and require all the limitations of, claim 11. For at least the reasons presented above, Susumu fails to teach or suggest all of the features of independent claim 11 and, thus, would not have rendered obvious claim 11. Despite its asserted disclosures, Fuminari fails to cure the deficiencies of Susumu with respect to claim 11. Therefore, Susumu and Fuminari, either separately or combined, fail to teach or suggest all of the features of claim 11 and the claims dependent therefrom.

For at least this reason, claims 20, 22, 24, and 26 would not have been rendered obvious by Susumu and Fuminari. Accordingly, reversal of the rejection is respectfully requested.

2. Method claims 28 and 30

Claim 28 is a method claim directed to polishing both sides of wafers with features corresponding to those of claim 27, with the exception the claim 28 depends from intervening claim 20 and, thus, requires the additional limitation set forth in claim 20. Method claim 30

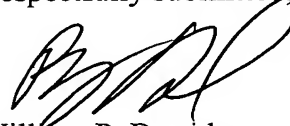
depends from claim 28. As such, claims 28 and 30 require all the limitations of independent claim 11. Thus, claims 28 and 30 would not have been rendered obvious by Susumu and Fuminari for at least the reasons discussed above. Additionally, as previously discussed, Susumu is directed to a lapping device and fails to disclose a method of polishing. The Examiner fails to 1) state the differences between claims 28 and 30 and Susumu and Fuminari, and 2) provide a reason or rationale why one of skill in the art would have used the lapping device disclosed by Susumu in a polishing device, such as that disclosed by Fuminari.

For the reasons discussed above, method claims 28 and 30 would not have been rendered obvious by Susumu and Fuminari. Accordingly, reversal of the rejection is respectfully requested.

VIII. CONCLUSION

For all of the reasons discussed above, it is respectfully submitted that the rejections are in error and that claims 11 and 19-31 are in condition for allowance. For all of the above reasons, Appellants respectfully request this Honorable Board to reverse the rejections of claims 11 and 19-31.

Respectfully submitted



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Attachment:
Notice Of Appeal

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APPENDIX A - CLAIMS APPENDIX

CLAIMS INVOLVED IN THE APPEAL:

11. A wafer-holding carrier which is used when holding wafers between an upper turn table and a lower turn table to which polishing pads are attached, and polishing both sides of the wafers by a polishing agent, wherein the carrier has polishing agent-passing holes for passing the polishing agent through as well as wafer-holding holes for containing and holding the wafers, and the total area of the polishing agent-passing holes occupies more than 20% and 30% or less of a main surface of the carrier, and each of the polishing agent-passing holes has a circular shape and a diameter of 5 mm - 30 mm.

19. A double-side polishing apparatus having at least an upper turn table and a lower turn table to which polishing pads are attached, a turn table-moving mechanism for moving the upper turn table and the lower turn table relatively, a carrier for holding wafers between the upper turn table and the lower turn table, and a carrier-moving mechanism for moving the carrier between the upper turn table and the lower turn table, wherein the upper turn table is provided with a polishing agent-supplying hole for supplying a polishing agent, and the carrier is the wafer-holding carrier according to Claim 11.

20. The double-side polishing apparatus according to Claim 19, wherein the carrier-moving mechanism moves the wafer-holding carrier circularly without rotation in a plane of the carrier to revolve the wafers held in the wafer-holding holes and between the upper turn table and the lower turn table.

21. The double-side polishing apparatus according to Claim 19, wherein hardness of the polishing pad is Shore A 50 or more.

22. The double-side polishing apparatus according to Claim 20, wherein hardness of the polishing pad is Shore A 50 or more.

23. The double-side polishing apparatus according to Claim 19, wherein material of the polishing pad is urethane or rubber.

24. The double-side polishing apparatus according to Claim 20, wherein material of the polishing pad is urethane or rubber.

25. The double-side polishing apparatus according to Claim 21, wherein material of the polishing pad is urethane or rubber.

26. The double-side polishing apparatus according to Claim 22, wherein material of the polishing pad is urethane or rubber.

27. A method for polishing both sides of wafers comprising using the double-side polishing apparatus according to Claim 19, containing wafers in the wafer-holding holes of the carrier arranged between the upper turn table and the lower turn table, moving the upper turn table and the lower turn table relatively while supplying a polishing agent from the upper turn table side, and moving the carrier between the upper turn table and the lower turn table, thereby to polish the both sides of the wafers.

28. A method for polishing both sides of wafers comprising using the double-side polishing apparatus according to Claim 20, containing wafers in the wafer-holding holes of the carrier arranged between the upper turn table and the lower turn table, moving the upper turn table and the lower turn table relatively while supplying a polishing agent from the upper turn table side, and moving the carrier between the upper turn table and the lower turn table, thereby to polish the both sides of the wafers.

29. The method for polishing both sides of wafers according to Claim 27, wherein amount of the polishing agent supplied from the upper turn table side is from 3 liters/min to 10 liters/min.

30. The method for polishing both sides of wafers according to Claim 28, wherein amount of the polishing agent supplied from the upper turn table side is from 3 liters/min to 10 liters/min.

31. The wafer-holding carrier according to Claim 11, wherein the polishing agent-passing holes are arranged in the form of concentric circle or lattice on the carrier entirely.

APPENDIX B - EVIDENCE APPENDIX

A copy of each of the following items of evidence relied on by the Appellants is
attached:

NONE

APPENDIX C - RELATED PROCEEDINGS APPENDIX

NONE